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## Broadway-Pantano Site

### Site Description

The Broadway-Pantano Water Quality Assurance Revolving Fund (WQARF) Site is located in east central Tucson. The site lies approximately in the area bounded by the Pantano Wash to the east, Sahuara Avenue to the west, Speedway Boulevard to the north and Broadway Boulevard to the south.

The site consists of the Broadway North Landfill (BNLF) and the associated groundwater contamination west of the Pantano Wash and north of Broadway Boulevard, as shown on the attached map. The contaminants found in the site groundwater at concentrations exceeding regulatory standards are tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride, cis-1,2-dichloroethene and methylene chloride.

Groundwater contamination has also been identified near the Broadway South Landfill (BSLF), also shown on the attached map. The contaminant found in groundwater above the regulatory standard at and near the BSLF is PCE.

Other contamination found at the Broadway-Pantano WQARF Site is buried metal waste at a dross site at the far southern section of the BNLF.

### Site History

The BNLF was originally developed as a sand and gravel mining operation in the mid-1940s. At different times in the 1960s and early 1970s,

the Pima County Sanitary District #1, the city of Tucson and Pima County disposed of municipal solid waste in these dug-out areas.

In 1987, PCE was detected in a city water well at the western edge of the landfill and this well was shut down. In 1989 and 1991, two other city wells down-gradient of the landfill were shut down because of the presence of PCE. (The groundwater flow direction at the BNLF is generally westward.)

In 1998, a fourth city well was shut down because of PCE contamination. PCE and TCE were detected in groundwater samples collected from the St. Joseph's Hospital well in 1994. City water was provided to the hospital until the city installed a wellhead treatment system in 1997. The treatment system removes the contaminants to below detectable levels.

The Broadway-Pantano Site was listed on the WQARF Registry by the Arizona Department of Environmental Quality (ADEQ) in 1998. WQARF is a program established by the Arizona State Legislature to conduct statewide surface and groundwater monitoring, study health effects of contamination, perform emergency remedial actions and conduct site investigations and long-term remediations. The WQARF program is funded with state monies and funds recovered from parties responsible for con-

tamination. ADEQ is currently investigating parties potentially responsible for the contamination at the Broadway-Pantano WQARF Site.

The groundwater contamination at the BSLF was discovered in the summer of 2000 when the city installed a groundwater monitoring well near the northwest corner of the BSLF. PCE was detected in groundwater at levels exceeding regulatory standards. Dross contamination was discovered at the BNLf during a site investigation in November 2000.

### **Site Investigation**

Until summer 2001, the city and county were funding/conducting the remedial activities at this site with ADEQ oversight. With the execution of a workshare agreement between ADEQ and the city in June 2001, ADEQ took over the site investigation and cleanup.

#### Landfill Investigation

In 1998, the city and county submitted a BNLf investigation report to ADEQ. Samples of soil gas (the air between the soil particles under the ground surface) were collected from beneath the landfill. These samples indicate that PCE and other volatile organic compound (VOC) gases from the landfill are traveling downward to the aquifer and dissolving in the groundwater, some 325 feet underground.

#### Landfill Early Response Action

The city and county installed a soil vapor extraction (SVE) system at the landfill in June 2000. This system removes ("vacuums") the soil gas underneath the landfill and treats the extracted gases with granular activated carbon (GAC) to remove the VOC contaminants. Since its installation, the SVE system has removed more than 5,000 pounds of VOCs, including approximately 1,200 pounds of PCE and 270 pounds of TCE.

In September 2002, a rebound test was conducted for the SVE system because the mass of contaminants removed had decreased greatly during

the past year. To run a rebound test, the system is shut off for an extended period, in this case, three months, and then soil vapor samples are collected and analyzed to see if the contaminant concentrations increase. (One reason rebound can occur is if contaminants are concentrated in very small-grained soils which tightly bind the contaminants and more time is needed for the contaminants to be desorbed/released from these soils.) When ADEQ tested all of the SVE soil gas probes in December 2002, contaminant concentrations increased only slightly, stayed the same or decreased. Based on these results, the system will be left off for the near future. ADEQ will be conducting another SVE soil gas sampling event in May 2003 to see if significant rebound occurs in the contaminant concentrations.

#### Dross Site Early Response Action

The dross site, consisting of metal waste buried at the southern end of the BNLf, is covered with clean soil and is fenced to prevent public exposure.

#### Remedial Investigation of Groundwater

Much work on the groundwater investigation has been completed. In July 2002, the city submitted to ADEQ a report documenting the city's previous groundwater investigation at the Site prior to the summer of 2001. During the past year, ADEQ has installed 12 groundwater monitoring wells at locations at the site where a better understanding of the horizontal and vertical extent of groundwater contamination was needed. The groundwater quality, flow direction and other hydrogeological information which is being collected will be analyzed to develop remedies for the groundwater contamination.

#### Early Response Action for Groundwater

Under the ADEQ/city workshare agreement, the city contracted for and oversaw the installation of the Western Groundwater Containment System (WGCS) and ADEQ has been reimbursing the city for most of the costs. The treatment facility is located just east of the Wilmot Library. The pur-

pose of the WGCS is to prevent further westward movement of VOC-contaminated groundwater in order to protect the city's central well field. The WGCS system consists of two extraction wells, two injection wells and a GAC treatment facility. The contaminated groundwater is being extracted, treated with GAC to remove the VOCs, and then injected back into the aquifer.

The WGCS system began operating in late March 2003. The system will treat approximately 2 million gallons of contaminated groundwater water each year. The city will operate and maintain the system and ADEQ will conduct the groundwater monitoring needed to evaluate the system performance.

#### Remedial Investigation of Other Potential Sources

The BNLF is a primary source of the groundwater contamination at this site. However, ADEQ is working to assess whether there are other sources contributing to the groundwater contamination.

#### **Potential Health Effects**

No one is known to be drinking contaminated water from this site and therefore no one is known to be at risk of exposure to these groundwater contaminants.

The city's policy is to shut down any city water supply well containing a VOC concentration that reaches one-half of the regulatory level. The St. Joseph's Hospital's well water treatment system

removes the VOCs to non-detectable levels.

The city and county's 1998 landfill investigation report included the results of a risk assessment. This risk assessment was based on assumptions that were extremely protective of human health. It concluded that there is no emergency risk to residents next to the landfill, yet the risk assessment did indicate that there is a possible future risk of VOC-contaminated landfill gases migrating underground toward residences next to the landfill if the landfill gases were left uncontrolled. The shallow landfill gas collection system is in the process of being repaired.

#### **For More Information...**

For technical information on this site, call Project Manager Gretchen Wagenseller at (520) 628-6708. For information about community involvement or the Community Advisory Board, contact Community Involvement Coordinator Eileen Palese at (520) 628-6712.

*Copies of pertinent reports are placed in the site information repository at the Wilmot Library, 530 N. Wilmot in Tucson, as they become available.*

For information about any WQARF site, visit the ADEQ Web site at [www.adeq.state.az.us](http://www.adeq.state.az.us). Click on Environmental Programs on the left, then click on Waste Programs Division, scroll down to Superfund (WQARF/NPL) Programs, and follow the prompts for the information you need.